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Fish and Wildlife Perspectives

Pipeline Surveillance from the Inside

By David W. Norton

Back in 1969-70, when I thought about the environmental threats of a proposed trans-Alaska oil line, there was a picture in my mind of an already-constructed line, gurgling hot oil across and through 800 miles of Alaskan landscapes to a waiting fleet of tankers in Valdez. Completely absent in this perception were the 20,000 workers, dust, noise and equipment in the whole three year construction phase. During this construction period, the Trans-Alaska Pipeline will succeed or fail as an environmental model, since by its sheer extent crosses hundreds of streams and traverses many wildlands. The haul road, material sites, river crossings, waste disposal sites, buried and elevated sections and so on will have to be constructed "right" for the whole system to maintain its integrity. Moreover, serious threats of permanent damage to fish and wildlife habitats arise during construction simply from the vast amount of earthmoving to be done, erosion possibilities, pollutants to be disposed of, and other problems.

Fortunately, persons with a better perception than mine put together a construction surveillance mechanism involving three principal organizations (see chart). Overseeing the construction are the State Pipeline Coordinator's Office (SPCO) for the 1/2 of the right-of-way across state land, the Alaska Pipeline Office (APO) for the 2/3 that crosses federal land, and the Joint State Federal Fish and Wildlife Advisory Team (JFWAT) that serves both APO and SPCO in recommending measures to prevent or minimize damage to habitats and populations.

I spent the first year of JFWAT's existence as an Alaska Department of Fish and Game biologist assigned to head the state half of the Joint Team. Biological surveillance by JFWAT actually involves three principal steps. 1. Design review, in which JFWAT biologists and engineers recommend acceptance, modification, or rejection of design elements submitted by Alyeska to SPCO and APO, in the form of notice-to-proceed applications. 2. Field surveillance, in which biologists check on the implementation of all features of the project that might affect fish and wildlife. 3. Technical evaluation, in which

specialists study the actual effectiveness of key design elements in having the desired effect of protecting critical resources. Technical evaluation is being conducted to assess the responses of moose and caribou to provisions of the project for their continued free passage requirements, the physical condition of spawning beds where the project may cause deterioration, and the populations of sport and commercial fish where the construction must significantly alter stream flows and other features of the aquatic habitats.

A memorandum that harshly criticized the entire pipeline surveillance effort crossed my desk in Spring 1975. It charged that excessive watch-dogging, and administrative duplications of effort among agencies would add \$2 billion to the cost of constructing the 800 mile trans-Alaska oil pipeline. The memo concluded with the suggestion that surveillance activities be dropped entirely, since Alyeska had agreed to a rigorous set of conditions (stipulations) before receiving lease rights to the right-of-way across state and federal land. In other words, industry had promised not to damage the environment by observing a set of detailed conditions, so day-to-day environmental policing of the work is unnecessary.

More recently, our Canadian neighbors have developed considerable interest in the Alaskan experience with pipeline construction and surveillance: who does it? is it necessary? does it work? how much does it cost? The complete answers to these questions will not come until after completion of the line. But some tentative answers are urgently needed for public review now.

IN THE ABSENCE OF SURVEILLANCE, STIPULATIONS HAVE BEEN VIOLATED, AND THE ENVIRONMENT HAS SUFFERED.

One of the saddest environmental abuses I saw occurred on a weekend in August 1974 on the upper Dietrich River, during construction of the haul road by Alyeska Pipeline Service Company. Just south of Chandalar Shelf, the Dietrich canyon and floodplain are narrow enough that people were having trouble with where to locate the road in consideration

the eventual pipeline alignment itself. Two ecological considerations entered the arena. One was the northernmost stand of spruce along the pipeline corridor, and the other the grayling-inhabited Dietrich River itself.

On that weekend in August, our local surveillance biologist was at home instead of at work out of Dietrich or Prospect Camp. He and I had worked with Alyeska and the Alaska Department of Highways during the preceding days to ensure that road construction would not impinge on the natural meander pattern of the Dietrich River at the White Spruce Forest, despite encroachment by the road into the active floodplain of the stream. We thought we had solved the problem of a tight squeeze between forest, stream, road and eventual pipeline in this stretch. Unless this natural meander quality is protected the "pool-to-riffle ratio" can be disrupted, and grayling migrating upstream to spawn annually can be frustrated by too long a stretch of fast water. Consider our dismay then on Monday, at finding that bulldozers had turned the Dietrich River into a storm drain configuration over the weekend, without authorization, and that the road was being constructed right down the middle of the floodplain. The whole action of re-channeling thousands of feet of river violated Stipulation number 2.5.1.1.

In succeeding months, we were given many different excuses for not mitigating the channel damage at the "White Spruce Re-route", and to date, the river has been left to its own devices. So far, the hydrologists' worst fears — that it would gouge a new channel through the sacred forest — have not been realized. But also, to my knowledge, no fish have been found above the lowest 1,000 feet of the storm drain. The White Spruce Re-route caused JFWAT to institute seven-day-a-week biological surveillance of each of six construction sections, plus Valdez terminal construction.

Another example of shortfall in environmental safeguards because of inadequate surveillance has been the whole jurisdiction of the Alaska Department of Environmental Conservation (DEC). While Alaska Department of Fish and Game (ADFG), with federal counterparts began participating as problem solvers, permit grantors and surveillance agents reasonably early, DEC had for any number of reasons not been able to plan and execute a surveillance force with its sanitary engineers and environmental field officers. Inadequacies in camp sewage treatment plants, many oil spills, and other problems have been detailed by the press as a result, and Alyeska faces prosecution by the State of Alaska on several civil and criminal actions. Both Alyeska and the state are seeing their money wasted, in this case because of inadequate surveillance in the broad sense, as exercised by JFWAT.

¹ ALYESKA MANAGEMENT AND SENIOR ENGINEERS GENUINELY WANT THIS CONSTRUCTION PROJECT TO BE AN ENVIRONMENTAL MODEL. BUT IT DOES NOT NECESSARILY FOLLOW THAT THEIR PERSONNEL PLACE ENOUGH EMPHASIS ON THIS ASPECT OF THE PROJECT, NOR THAT THEY HAVE A CLEAR IDEA OF HOW TO ACCOMPLISH WHAT WE ALL WANT.

There are often wide gaps between professing environmental concern and designing, funding and executing a biologically sound element of the project. Drainage structures on the haul road and the construction work pad are prime examples. Fishery biologists and hydrologists developed a specification for all fish streams that stream velocities should not exceed four feet per second during a normal five year flood, or runoff, through any drainage structure. Culverts are more expensive the bigger their diameter, and bridges are more expensive than culverts to install.

Alyeska's first priority is to build a pipeline, and the environment comes a distant second. Evidence for this asser-

tion is the amount of Alyeska counter-effort we would experience after prescribing bridges over culverts, or a larger culvert in preference to a small one. Alyeska would often dispute the documentation for drainage area, or discharge rate, or the existence of fish in a given drainage. Streams where we lost the original debate include Rosa Creek near the Salcha River, and Marion Creek near Wiseman. Both stream crossings have turned out to be very costly, requiring two re-installations of an inadequate culvert on Rosa Creek and a severe road wash-out plus several close calls on Marion Creek, which still has culverts instead of the clearly indicated bridge.

Technology imported from Outside and misapplied in Alaska has cost the environment and the project a considerable amount. "Low water crossings" (LWC's) were the brainchild of some engineer in the system, anxious to gain fame for saving money. These LWC's, I'm told, were essentially mimics of West Texas fords, meant to speed construction of the workpad across



Prudhoe Trash Dump

Peter Lent

streams, and allow limited equipment crossings through flowing water, without the bother and expense of culvert placement. We biologists had grave misgivings about the whole scheme, but agreed to construction of a few on a trial basis. They were a very bad mistake in retrospect, as Alyeska behaved like a salesman with his foot in the door. Many were built, and nearly all failed because of ice-rich silts underlying the thin gravel veneers, or because of the impossibility of using D-9 cats as the precision instruments required for careful sculpturing of LWC's, or because of failure of the structures under heavy traffic and high runoff, streams were silted, fish passage blocked, equipment stuck, and construction delayed.

THE ATTITUDE OF KEY ALYESKA PERSONNEL IS A LARGE FACTOR IN SUCCESS OR FAILURE OF JFWAT SURVEILLANCE.

When the system works right, Alyeska construction personnel lay down the law to the contractor, and this process includes environmental considerations. When the camp managers and project engineers have taken the time to listen and interact directly with the biologists, they could persuade the contractor to meet environmental requirements. In the best cases, Alyeska's engineer/managers have viewed the JFWAT biologists in their sections not as adversaries, but as counterpart experts from another discipline.

All too often, however, the system did not work right, rather it worked "through channels". If a section biologist wanted a design modification, he was supposed to write this to the state or federal "officer" with supporting reasoning and reference to stipulations. The officer then told Alyeska's top man. Alyeska's top man passed the message to Bechtel's top man. Bechtel went to the contractor's representative, the contractor's representative then passed the message through one

more levels until it reached the man at the controls of the equipment. There's a parlor game in which a person starts a whispered message around a circle, and compares the message he receives to the one he initiated. More than once, I compared the equipment operator's understanding to the original message initiated by JFWAT. "I was told the environmentalists wanted me to do it this way for some reason," was a typical response. If I then broke all rules, and explained the problem and desired result to the cat skinner or welder, he would often brighten up and say, "Oh, I getcha, but I've got a much better way to do that". And he did. The parlor game with the environment as the brunt of the joke was not funny.

And yet I found altogether too prevalent a cartoon mentality about biological problems. "Don't silt the streams — fish have to see too" was the caption of an Alyeska poster, under an angry fish wearing goggles against gobs of particulate matter streaming past. Little wonder that we were asked why Alyeska had to keep the water clear, when spring water runoff, or days of rain would make the streams turbid. We would then have to explain that siltation really meant the fallout of silt on egg-bearing spawning gravels that suffocated the developing eggs. Silty water during high water did not usually threaten to cut off oxygen flow to embryos, because the stream was flushing itself during this period. Or another caption: "Don't feed the bears — we need you" should have been at the bottom of a full color photograph of a bear mauling victim, not a cartoon of a silly bear pulling at the seat of the pants of a silly hard-hat.

The best example of environmental conscience and effective action that I saw, took place on a fuel spill accident at Lost Creek, just north of Livengood on the TAPS road. A bit of background is necessary to understand the problems we faced on this road. The Elliott and TAPS (trans-Alaska pipeline system) highways are public, state highways, and as such are not under Alyeska control, unlike the Yukon River-to-Prudhoe Bay haul road. Common carrier tank trucks, even when bound for pipeline camps north of the Yukon carry fuel that is not Alyeska's responsibility until it crosses the Yukon, and does not become Alyeska's property until delivered. Stipulations for environmental protection, and Alyeska's Oil Spill Contingency Plan apply to the pipeline right-of-way, not to public highways. Therefore, despite Alyeska's unique capability to clean up oil spills, the pipeline consortium has no legal responsibility to clean up after an accident to one of these many tank trucks. Moreover, Alyeska feared legal liability problems if they stepped in on a common carrier spill, and in the course of cleaning up, caused some environmental damage, or disturbed evidence needed by police.

Faced with a high probability of many accidental spills between Fairbanks and the Yukon, I understood, with the Department of Environmental Conservation, the Alaska Attorney General's Office, and Alyeska, to close this loophole in pipeline surveillance. We secured an agreement that committed Alyeska to cleaning up common carrier spills under the direction of either JFWAT biologists, or DEC personnel, in return for which the Attorney General's Office would assist Alyeska in recovering the costs of cleanup from the legally responsible party — usually a trucking company — and protect Alyeska from any liability problems by arguing that Alyeska was acting under the state's request for assistance.

When 5,000 gallons of diesel fuel erupted from an overturned tank truck above Lost Creek on June 4, the agreement was put to the test. Oil had flowed downhill 600 feet of the total 700 feet between the accident and the grayling stream by the time JFWAT biologist Al Townsend could get to the scene and prescribe action. He located the front of the moving mass of oil and determined that a catch basin should be excavated between the front and the creek to check the flow.

He requested and promptly received excavating equipment that Alyeska's Livengood resident site engineer, Jim Bunch, had to divert from pipeline construction. Al, with Jim's help had the problem under control, with oily water being pumped out of the pit into tankers in a matter of hours, on June 5. But on June 6, the forecast for heavy thunderstorms threatened to sweep oil downhill faster than pumps could cope with it. Accordingly, we requested the help of all parties concerned to consider and carry out if possible a burn-off of the fuel, which was by now spread out over an acre of tundra and on the surface of several small ponds. DEC, BLM (Bureau of Land Management) Fire Control personnel, the State Forester, the APO representative, and I all converged on Livengood by late morning. Two or three burning permits were granted on the spot, and BLM directed precautionary clearing around the burn area to prevent the fire from jumping to nearby black spruce. Alyeska made available some 25 to 30 laborers, and a dozen pieces of equipment including fire trucks. An orange fireball and gigantic plume of black smoke signalled the end of the problem in late afternoon. The burn-off petered out through the night into a series of wick fires where fuel had seeped up into the moss. Diesel fuel which is highly toxic to aquatic life never reached Lost Creek, and the fire-blackened area had naturally revegetated by fall. The lesson from this episode is that both prompt interagency mobilization and prompt cooperation by Alyeska can work to solve environmental problems. But it does require a tremendous effort and the attitude of mutual respect on everybody's part.

SURVEILLANCE AND ENVIRONMENTAL STIPULATIONS AND REGULATIONS HAVE NOT SLOWED THE CONSTRUCTION SCHEDULE OF THE ALYESKA PROJECT.

A Congressional subcommittee has twice held hearings to probe the reasons for "slippages" in construction scheduling earlier this year, and to investigate the possibility of squeezing the first oil out before the target date of July 1977. Under pointed questioning, Alyeska's contractors' representatives had to admit that environmental concerns, translated into surveillance, had nothing to do with the project's being behind schedule, (temporarily, it now appears). We biologists feared that the thrust of the Congressional inquiry was to uncover grounds for curtailing the surveillance effort, which by then we knew to be such a big job that we were barely holding our heads above the current of paper. We were, at the time of the first hearing, in the middle of the design review phase.

JFWAT was very nearly buried by the deluge of "Notice-to-Proceed" applications, on which biologists were generally afforded the opportunity to non-object, or recommend changes before either APO or SPCO granted the Notice-to-Proceed for a certain segment of work. Sometimes, in their haste to meet self-imposed deadlines, the state or federal pipeline offices would overlook or overrule biologists' questions and recommendations. In these cases, JFWAT would fall back on its second line of defense against ecological damage, that of field surveillance biologists, to secure field design changes, particularly for drainage structures.

EXTENSIVE RE-PROGRAMMING AND BREAKS WITH TRADITION WERE NECESSARY FOR BOTH STATE AND FEDERAL AGENCIES IN PLANNING AND EXECUTING SURVEILLANCE TEAMS.

The design review and field surveillance on a vast, modern, high-speed construction project just do not come naturally to an agency such as the ADFG — these are new, post-National Environmental Policy Act (NEPA) activities. I hate to think how far out of the picture fish and wildlife concerns would have been, had not three far-sighted biologists worked hard at planning, long before JFWAT came into being. These three were Mike Smith, (currently the head of the Alaska Division of Lands), and Bob LeResche (currently Chief of Habitat) then both of Fish and Game, and Jim Hemming, previously



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at the state but at the time with BLM and presently head at the federal side of JFWAT. In 1973 and early 1974, they mapped out meticulously and flexibly the staffing schedules, salaries, deployment, authority and state-federal cooperation aspects of JFWAT. It is fair to say that this planning had everything to do with the success of JFWAT. On a trip to Calgary recently, I was asked by biologists contemplating a gas pipeline about the level of training represented on JFWAT. They were very surprised to learn that virtually the entire staff of 30 biologists were PhD and Master's level. Wouldn't biological technicians have served the purpose? In response, I pointed out that we never tried nor could we have put together a manual of procedures, or guidelines by which biologists could have "cook-booked" design review and surveillance. Rather, there were always unforeseen conditions and problems, and a heavy weight of responsibility lay with the individual biologist to make sound judgments on these issues.

An example of this was what to do about fueling and overnight parking of heavy equipment in gravel borrow sites located in active river floodplains. The conditions of the permits for these sites clearly prohibited fueling or parking, to prevent fuel from entering the river water through the porous gravel of the pit floor. But Alyeska often violated these conditions. Our field biologists could have thrown Alyeska out of the pits, going by the letter of the permit. But in most cases, they kept a close watch on the equipment operations, recognizing how expedient it was for Alyeska to service dozers and scrapers in the borrow pit. So long as the spillage and leakage were very minor, they would only require Alyeska to scoop up contaminated patches of gravel for incineration, as the use of the pit was completed. Basically, the field biologists expended their efforts on real and immediate threats to the environment, rather than being unreasonably strict to the letter of the permit or stipulation. Because of the quality of our field staff, I never as a supervisor had to overrule a single judgement of theirs. Again, this speaks very highly of the planning by Smith, LeResche and Hemming, who were determined that the Joint Team was to have the best biologists that could be hired.

THE COST OF SURVEILLANCE CAN NOT BE JUDGED SIMPLY BY ITS DOLLAR OUTLAY.

Surveillance costs are reimbursed to the state and federal governments by Alyeska, and are assessed as a cost of construction. The cost of running JFWAT during construction I estimate to be about \$6 million, or 1/10 of one percent of the overall construction cost. In terms of royalty monies eventually accruing to the state, every dollar spent on construction will cost the state some 40c in lost revenue. So JFWAT will cost the state eventually \$2.4 million. On the other hand, how much would an infinitely wise person invest to assure the continued productivity of salmon, grayling, caribou, and Peregrine Falcon habitats potentially affected by the pipeline? How much revenue to the state and its people will be realized in future generations from fishermen, hunters, and recreationists, who can still enjoy streams not turned into storm drains, freely

moving bands of caribou, and scenery uncluttered by unsightly scars from the days of Alyeska construction?

Viewed in another light, Alyeska is required by grant of right-of-way provisions to rehabilitate or replace productivity of spawning beds it destroys. In one go-round JFWAT biologists saved Alyeska from destroying a spawning area for chum salmon in the Tanana River that we estimated would have cost a half million dollars (state taxpayers' share \$.2 million) to replace. Everytime a drainage structure adequate for fish passage is insisted upon by JFWAT, chances are, that structure will also be upgraded to the point it will not require continued expenditures for maintenance or reconstruction following washouts. Doing right by the fish means doing right by the project and its cost in many cases.

THERE ARE MISTAKES MADE IN THE SURVEILLANCE EFFORT.

Had I to do over again my year with surveillance, I'd have a list of mistakes to avoid. Most of them would be procedural, like: don't ever trust a verbal directive to industry to have the desired effect; and always assume you will be misquoted by somebody else whose interests differ from your own.

One fault of surveillance generally to date is the spottiness of public input-output. In many of the key governmental surveillance posts (outside JFWAT) I detected deep-seated mistrust of environmental groups, and of the press. Gradually, the sense of being walled off from the Anchorage and Fairbanks Environmental Centers, the Alaska Conservation Society and other groups grew to an alarming level. Part of the problem was that physically, members of public, including investigative reporters, could not gain access to much of the project, because of "security" measures. They could not see it, (i.e. the project) and could much less ask ^{informed} questions about environmental problems.

But more important, there was not enough time to spend with groups or individuals to impart more than a tiny fraction of what was going on, or of all the contextual background behind the gray decisions being made. The project was too immense and too fast-moving. The State Pipeline Coordinator, Chuck Champion, spent much time and effort responding to public inquiry. His reward has been a heap of implied or explicit allegations, most lately in the last issue of the ALASKA CONSERVATION REVIEW, that he is deceitful of the public and press. (These allegations have mystified me, as they have dealt with issues outside JFWAT's professional interactions with Champion, in which I found him above reproach).

In comparison with the federal surveillance office, Champion has been outstandingly accessible and candid. Against this background, I dreaded the day a reporter might request a lengthy interview — not because JFWAT or I had anything to hide but because we might be quoted out of context regarding the frequent in-house disagreements between JFWAT and the other offices, and cause breakdowns in working arrangements within the whole surveillance effort. This dread was really unfortunate, because the surveillance process needs public scrutiny and input for its own benefit. When we were having trouble persuading Alyeska to relocate some feature of the pipeline, for example, it would have been helpful to have public support for our position. The reporter, needing to "sell" a story, goes after a juicy revelation centered on a guilty person. Who wants to read a story that examines problems with the decision-making structures and processes without printing an accusing finger? And I suspect conservation groups are bored with this pipeline, preoccupied by the next, and discouragingly unresponsive to the many precedent-setting lessons learned so far in the Alyeska experience. I don't have all the solutions, but could we go back to square one, I would argue for regular and consistent public input, perhaps by means of an advisory board, as well as deliberately encouraging press review.



